Solar non-hardware costs – the aggregation of all the time, effort, and fees expended while dealing with myriad people and processes – are now the greatest barrier to achieving national SunShot price and deployment targets. This "soft cost" challenge is nothing new; the sciences of innovation diffusion and market transformation have a rich tradition of seeding innovative programs that make energy technologies cheaper, faster, and easier to adopt. The advent of big data, predictive tools, and controlled field experiments has the potential to present a better solution set. This new science could be a game changer for how solar practitioners approach soft cost reduction. In this breakout session, the state of the art in soft cost science will be presented and open questions about the future of the science will be discussed.

Bryan Bollinger
NYU Stern School of Business
Disentangling solar soft cost reduction opportunities by synthesizing solar market data with new econometric models

Varun Rai
University of Texas at Austin
Integrating a rich array of energy market datasets into predictive numerical models of solar adoption across space and time

Dena Gromet
The Wharton School, UPenn
Understanding solar customers by applying tools from the social and behavioral sciences to quantify decision pathways
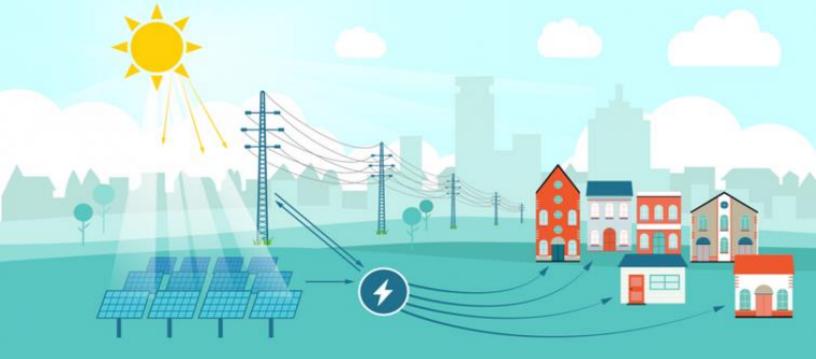

Kim Wolske
University of Michigan
Partnering with solar installers to develop and apply real-world insights that can improve lead-to-sale conversion rates

The presentations during this session feed directly into a workshop on Thursday, May 22, 2014, titled "New Ideas for Seeding Your Solar Marketplace: Program Pilots and Embedded Experiments."

These efforts to harness real-world data to solve solar industry challenges are supported by the SunShot **Solar Energy Evolution and Diffusion Studies** (SEEDS) program. By charting market evolution and technology innovation, seven teams are advancing and applying new branches of science to spur solar cost reduction. Big data, network science, behavioral economics, and social physics have emerged as powerful tools in the SunShot toolbox. Over the next three years, the SEEDS program is poised to make scientific leaps that transform data into strategies underlying the design and implementation of energy policies.

New Ideas for Seeding Your Solar Marketplace
Program Pilots and Embedded Experiments

A half-day workshop exploring what's next for solar deployment programs across the U.S.
SunShot Grand Challenge Summit | Thursday, May 22, 2014 | Anaheim, California

Installers, utilities, non-profits, and policymakers are charged with creating on-the-ground solar programing. A new set of tools, developed by social scientists and strengthened with the availability of data with astounding depth and breadth, can now be applied to **make energy programs better**: more effective, flexible, and affordable. Data-driven, low-cost, real-time embedded evaluation is solving some of the largest energy challenges, from changing consumer behavior to ramping up adoption of new tech. Solar decision makers, in partnership with top researchers, have an opportunity to advance and apply this new science.

In this interactive workshop, some of the most **stubborn soft cost challenges** will be confronted, and creative methods for tackling them will be devised. First, solar practitioners will pose their most difficult open questions related to customer acquisition, permitting, incentives, and other soft costs. Next, scientists will introduce the progress they're making at probing these questions via modeling and field experimentation. Working groups will then devise and pitch programs and policies that embed state of the art rapid iteration.

The workshop goals are for program implementers to gain a new set of tools, for researchers to discover the next big questions, and for both groups to form new partnerships.

Solar Soft Cost Challenges

New Soft Cost Solution Set

➢ **Randomized control trials**: in-field A/B testing to identify what works in the solar market and then quickly scale it up

➢ **Leveraging peer effects**: combining economic and social incentives to optimize the use limited program dollars

➢ **Predictive modeling**: applying data and simulations to optimize solar program designs before launching them

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